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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/067,167	02/04/2002	Anthony D. Kurtz	Kulite-69	4919

28581 7590 07/25/2005

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EXAMINER
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NECKEL, ALEXA DOROSHENK

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 07/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/067,167

Applicant(s)

KURTZ, ANTHONY D.

Examiner

Alexa A. Doroshenk

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 16, 2005 has been entered.

### ***Claim Rejections - 35 USC § 102***

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. Claims 1-4, 6-11 and 18-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Little (4,392,362).

With respect to claims 1, 8, 9, 18 and 19, Little discloses an apparatus comprising:

a wafer of silicon (90);

a layer of borosilicate glass (95) (col. 8, lines 4-6) deposited on the silicon wafer (90);

a plurality of channels (94) between the silicon (90) and glass (95) with inlet and an outlet (col. 8, lines 13-16);

where the channels intersect (see figures 1-4); and

wherein the silicon (90) and glass (95) are bonded by a field assisted bond (col.

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8, lines 6-8).

It is held that oxygen ions would inherently form in all areas of the glass when field assisted bonding is used, including at the intersections of the channels.

With respect to claims 2 and 3, Little discloses wherein the channels run in both X and Y directions on the structure (see figures 1,2 and 4).

With respect to claims 4 and 7, Little discloses wherein there are additional wafers which are bonded to each other (col. 4, lines 25-26 and figures 5, 6, 10d and 11).

With respect to claim 6, Little discloses wherein the channels are rectangular in cross-section (see figures 5, 6, 8c, 8d, 9b, 9c, 10d and 11).

With respect to claim 10, Little discloses wherein there are vertical ports in the top layer in communication with the channels to enable fluid to be introduced to said channels (col. 4, lines 37-40).

With respect to claims 11 and 20, Little discloses all of the same structural elements made up of the same materials and therefor would inherently be capable of producing a high electric field when a voltage is applied to the structure.

***Claim Rejections - 35 USC § 103***

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 5, 12, 13, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Little (4,392,362) in view of Ashmead et al. (5,690,763).

With respect to claim 5, Little discloses wherein the channels are vee or

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rectangular shaped in cross-section and formed by etching, but does not disclose wherein the are circular in cross section.

Ashmead et al. discloses wherein etching can also be used to form curved/circular cross-sectional shaped channels/pathways (col. 14, lines 38-42). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the channels of Little with circular cross-sectional shape as it is merely the selection of another shape of channel formed by etching known to be effective in micro-reactors.

With respect to claim 12, Little fails to disclose wherein the channels are coated with a metal.

Ashmead teaches wherein silicon wafers in a micro-reactor can be coated with a metal, such as from groups II, IV and V, in order to increase resistance to corrosion and wear (col. 6, line 58- col. 7, line 3). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a metal coating to the wafer of Little in order to gain the advantage of increased resistance to corrosion and wear as taught by Ashmead.

With respect to claim 13, Little discloses wherein the channels are from 5-500 microns wide and thus fails to disclose wherein the channels have a diameter between 1 to 10 mils.

Ashmead et al. teaches wherein in micro-reactors (which can be made up of silicon and borosilicate glass wafers) can have channels from 10-5000 micrometers (.4-197 mils). It would have been obvious to one of ordinary skill in the art at the time the

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invention was made to modify the size the channels of Little larger when increasing the overall size of the reactor and since those particular dimensions of channels are known to be effective in a micro-reactor.

With respect to claim 16, Little fails to disclose wherein the silicon wafer is coated with silicon dioxide.

Ashmead teaches wherein silicon wafers in a micro-reactor can be coated with silicon dioxide in order to increase resistance to corrosion and wear (col. 6, line 58- col. 7, line 3). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a silicon dioxide coating to the wafer of Little in order to gain the advantage of increased resistance to corrosion and wear as taught by Ashmead.

With respect to claim 17, Ashmead discloses wherein the coating can be from group III of the periodic table, which include Aluminum.

6. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Little (4,392,362) in view of ) in view of Ashmead et al. (5,690,763) as applied to claim 12, and further in view of Christl et al. (4,078,604).

With respect to claim 17, Little as modified by Ashmead teaches wherein silicon wafers in a micro-reactor can be coated with a metal, such as from groups III, IV and V, in order to increase resistance to corrosion and wear (col. 6, line 58- col. 7, line 3), but fails to teach wherein the metal can be gold.

Christl et al. teaches an apparatus wherein the cooling channels are coated with gold to ensure corrosion resistance of the cooling fluid (col. 1, lines 38-42). It would

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have been obvious to one of ordinary skill in the art at the time the invention was made to apply the teaching of Christl et al. to the modified apparatus of Little and apply a coating of gold to the channels in order to ensure corrosion resistance.

7. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Little (4,392,362), as applied to claim 1, and further in view of Robillard et al. (3,984,620).

With respect to both claims, Little discloses wherein the silicon wafers can be of those used in semiconductor electronics (col. 1, lines 12-29).

Robillard et al. teaches wherein silicon wafers for use in semiconductor are preferably intrinsic or doped silicon (col. 5, lines 4-7). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use intrinsic or doped silicon for the wafers of Little as it is merely the selection of semiconductor appropriate silicon wafers known to the art and as taught to be preferable by Robillard et al.

### ***Response to Arguments***

#### **Claim Objections**

The objection to claim 13 is withdrawn due to applicant's amendment.

#### **35 USC 112, Second Paragraph Rejections**

The 35 USC 112, second paragraph rejections of claims 7, 18 and 19 are withdrawn due to applicant's amendments to the claims.

#### **35 USC 102 and 103 Rejections**

Applicant continues to argue the claims are directed toward "a miniature reaction

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chamber template structure for fabrication..." and that the device of Little is not a miniature reaction chamber template structure, but rather a miniature cryogenic device.

The examiner continues to not be persuaded as applicant has yet to point out actual **structural** differences between the claimed apparatus and that of Little. As previously indicated by the examiner, the preamble of the instant claims are directed toward intended use rather than structure. A recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus if the prior art apparatus teaches all the structural limitations of the claim. MPEP 2114.

The examiner agrees that Grantham fails to inlet openings for the channels since the channels are taught to be sealed. The rejections based on the Grantham reference are withdrawn.

### **Conclusion**

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexa A. Doroshenk whose telephone number is 571-272-1446. The examiner can normally be reached on Monday - Thursday from 9:00 AM - 7:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

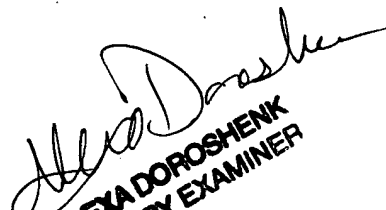


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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Alexa A. Doroshenk  
Examiner  
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July 21, 2005

  
ALEXA DOROSHENK  
PRIMARY EXAMINER